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Virginia Quiet Pavement Implementation Program

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Joint Commission on Transportation Accountability

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“Quiet” Pavement

What it is:

- In General – a wearing surface that minimizes tire-pavement noise production and propagation

Bad



Good



“Quiet” Pavement

Asphalt – “small-textured” porous mix (e.g., open-graded asphalt concrete)



“Quiet” Pavement

Concrete – negative-textured longitudinal grind and groove (e.g., “Next Generation Concrete Surface”)



Noise Measurement

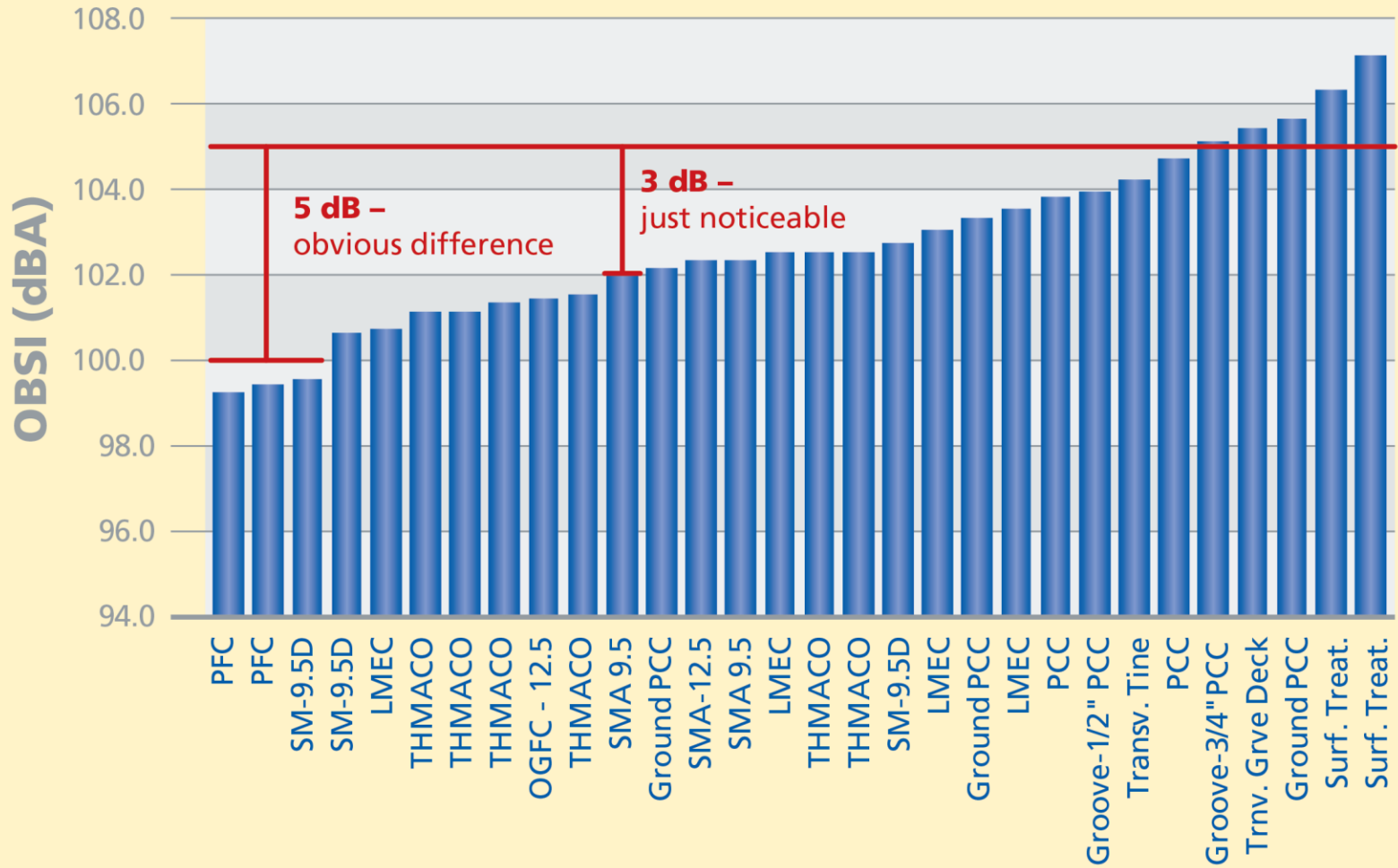
Wayside



Tire-Pavement (i.e. OBSI)



Typical Virginia Surfaces



Chapter 790 of the 2011 Virginia Acts of Assembly (*Code of Virginia* § 33.1-223.2:21)

Directs VDOT to:

- Expedite the development of QP technology by including contract specs for QP technology and sound mitigation alternatives if sound mitigation is a consideration.
- Construct demonstration projects to assess QP technologies.
- Perform assessments to evaluate functionality/safety of QP technology in Virginia's climate over two full winters.
- Provide an interim report to the Governor and the General Assembly by June 30, 2012, and a final report by June 30, 2013.
- Include in the report:
 - Results of demonstration projects,
 - Results of the use of QP in other states,
 - A plan for routine implementation of QP, and
 - Safety, cost, performance issues of the technologies.



Quiet Pavement Task Force

Co-Chairs:

Andy Babish, PE, State Materials Engineer

Richard Schreck, Executive Vice President, VAA

Members:

Emmett Heltzel, PE, VDOT Maintenance Division Administrator

Trenton Clark, PE, VAA Director of Engineering

David Lee, PE, VDOT Salem District Materials Engineer and
Chairman VCTIR Asphalt Research Advisory Committee

Paul Kohler, VDOT Noise Abatement Section Manager

Michael Sprinkel, PE, VCTIR Associate Director of Research

Kevin McGhee, PE, VCTIR Associate Principal Scientist

Ed Dalrymple, Vice President, Chemung Contracting

David Helmick, Vice President, Superior Paving Corp.

Bob Long, American Concrete Pavement Association

Del. Jim LeMunyon, JCTA Subcommittee on Quiet Pavements



Project Selection Criteria

- Four-lane divided, high-speed corridor
- Good overall pavement structure
- Good geometrics
- Limited at-grade intersections
- 1-mile per asphalt technology/ ½-mile for concrete
- No curb/gutter or existing sound mitigation measures

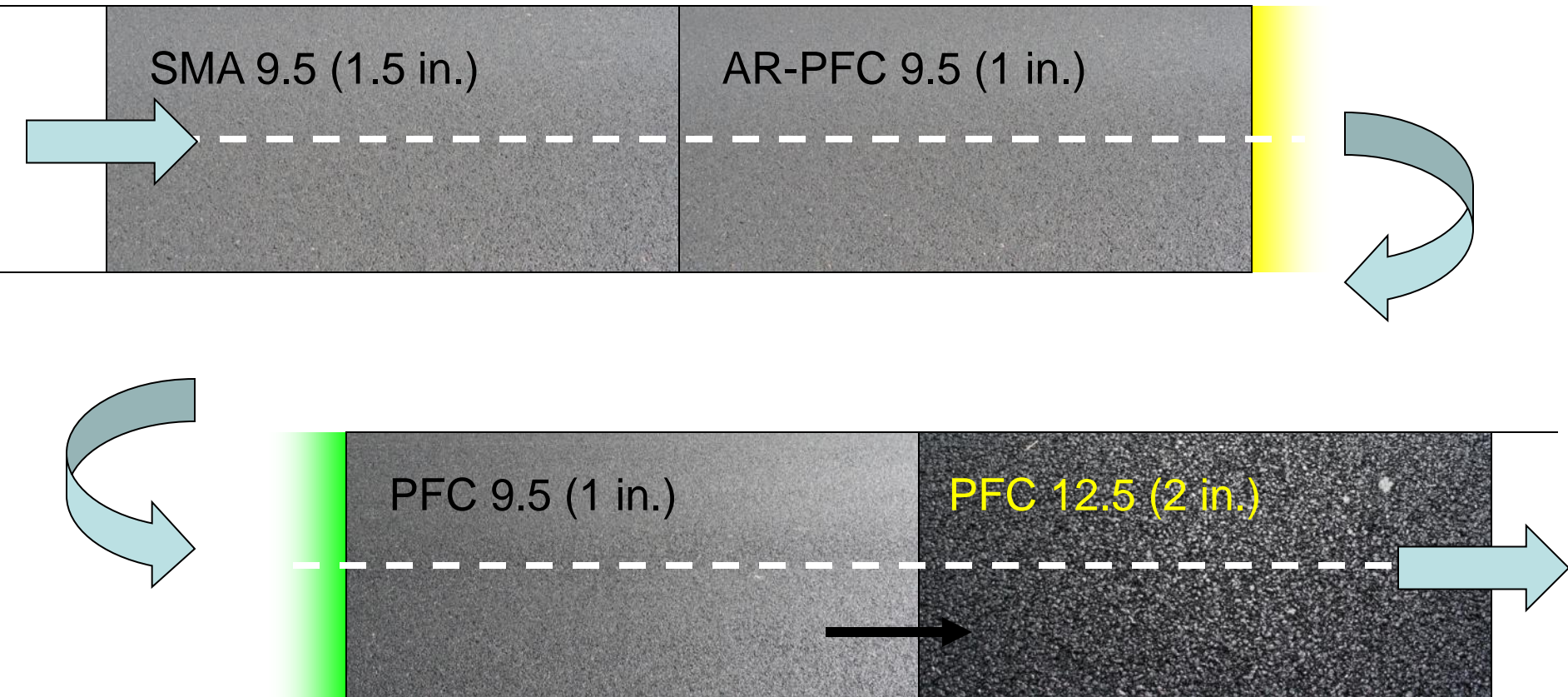


Demonstration Projects (2011)

- 1 SR 7 By-Pass in Leesburg (A)
- 2 SR 199 west of Williamsburg (A)
- 3 SR 288 near Chester (A)
- 4 I-64 Virginia Beach (C)
- 5 SR 76 Richmond (C)



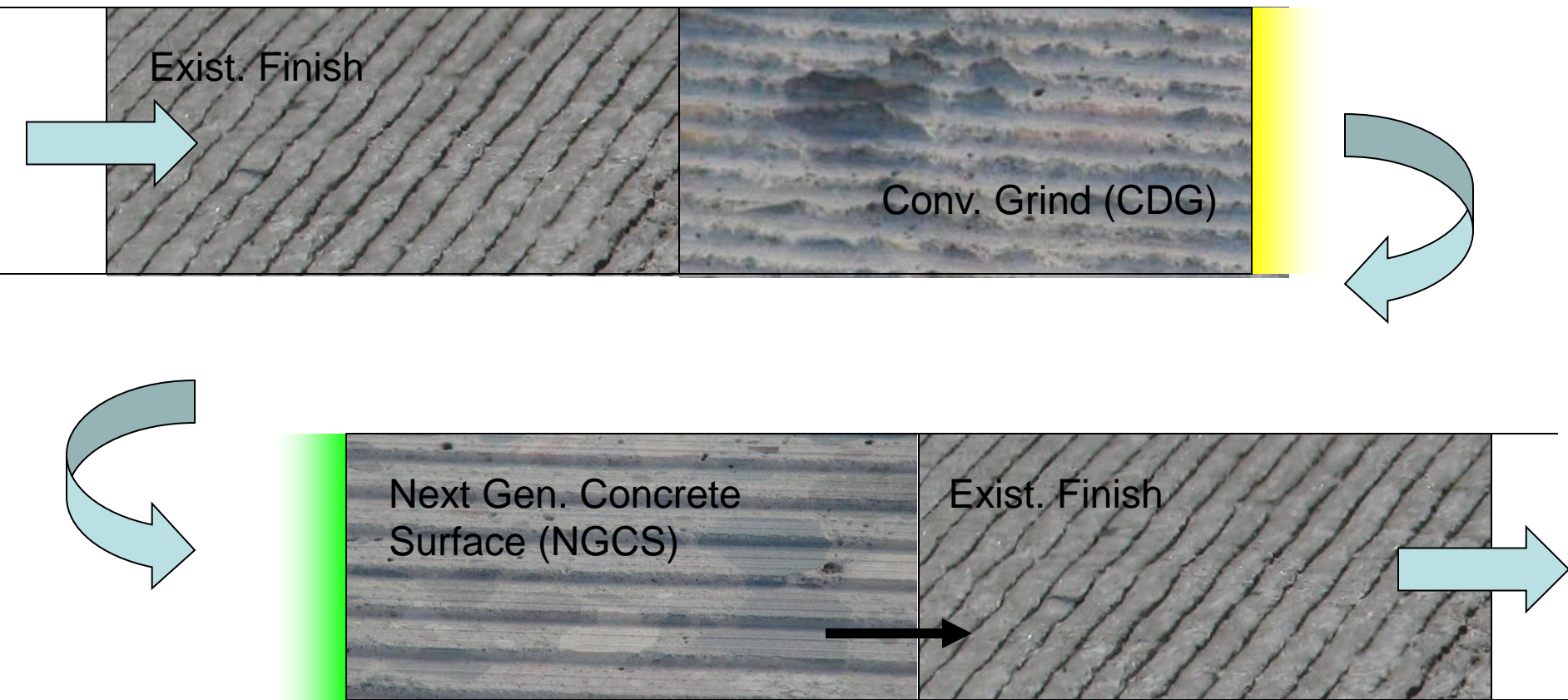
Demonstration Projects (Asphalt)



Plan View



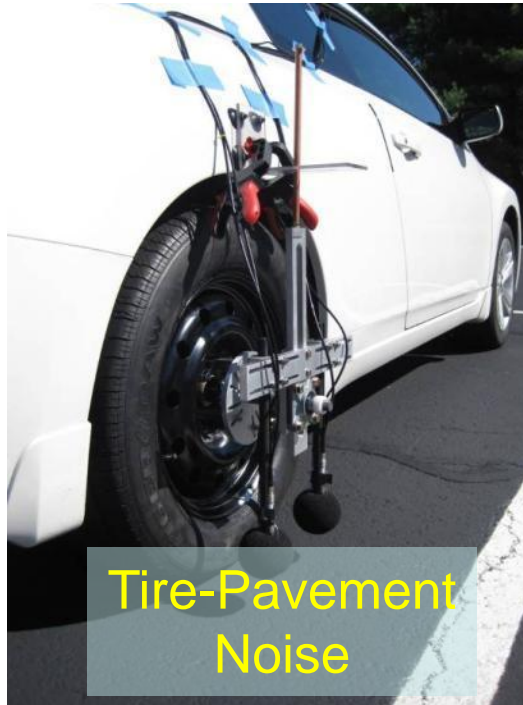
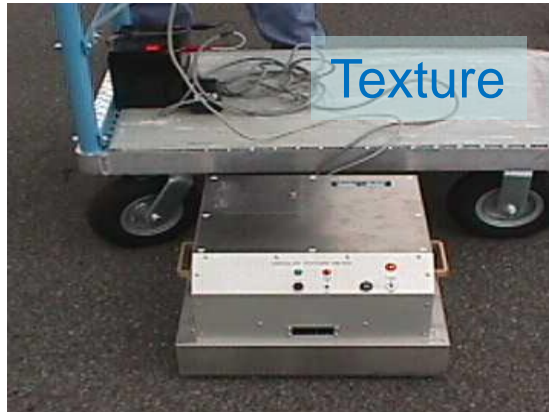
Demonstration Projects (Conc)



Plan View



Functional Evaluation

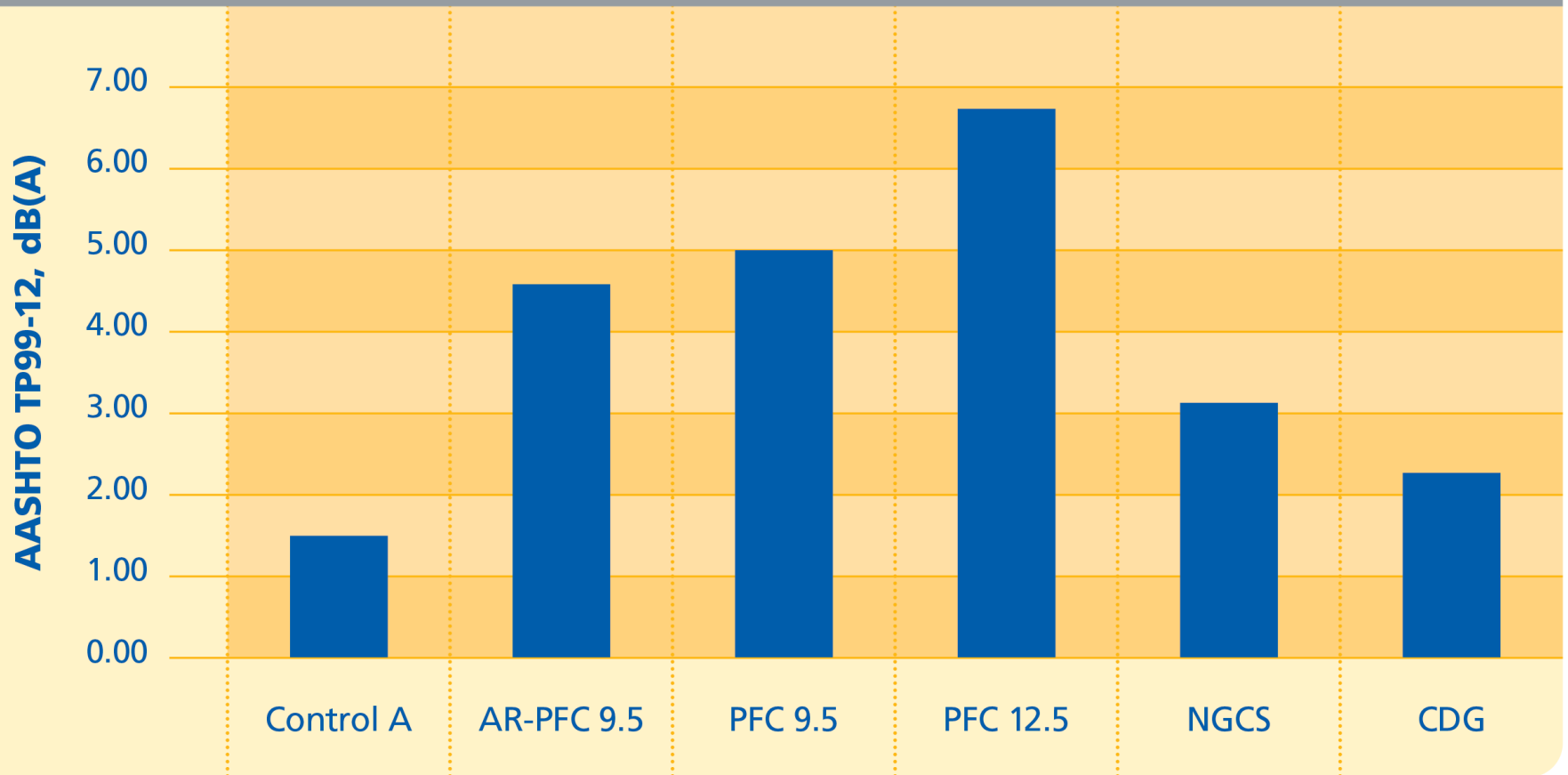


Winter Function &
Maintenance

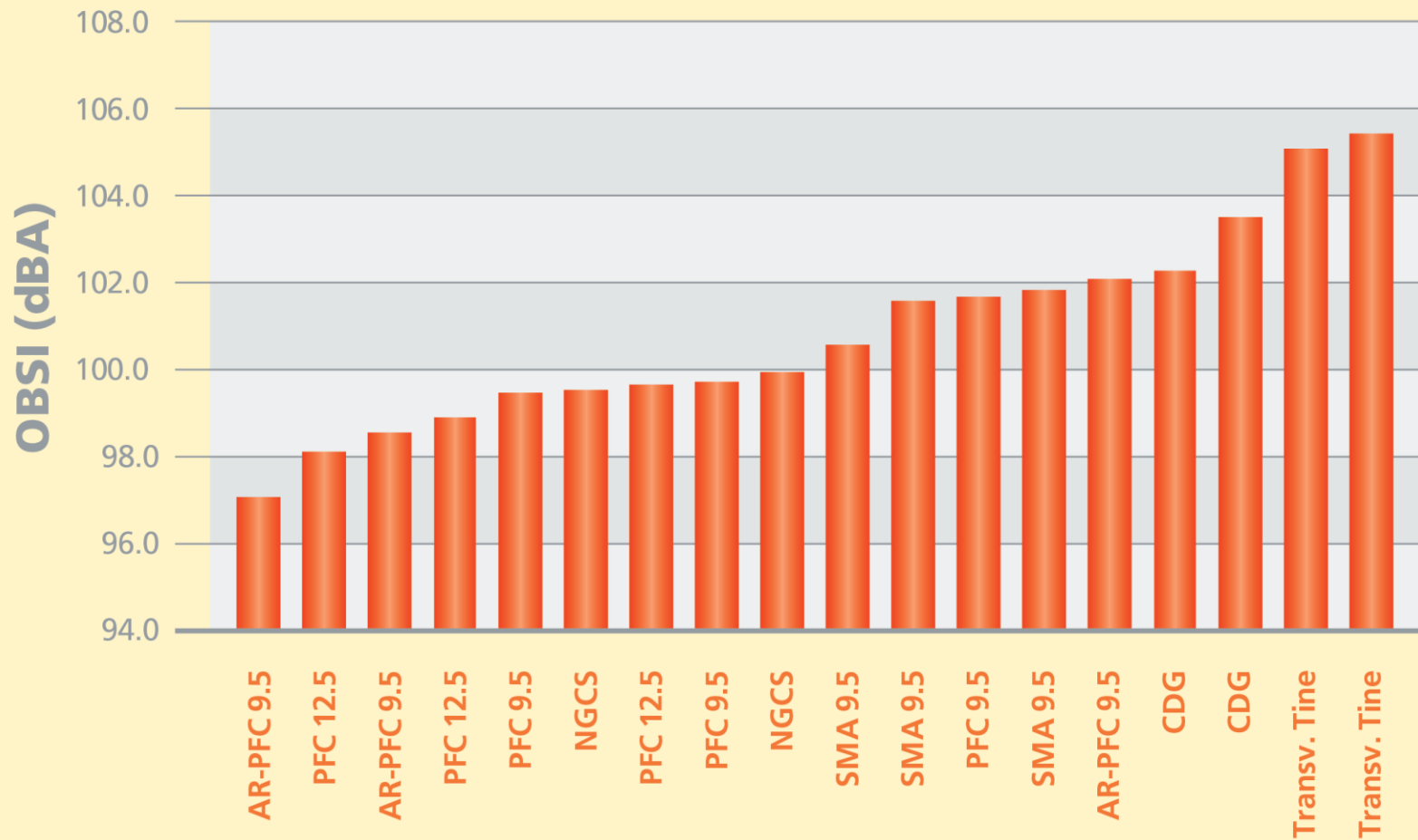
Preliminary Findings - “new” materials and treatments



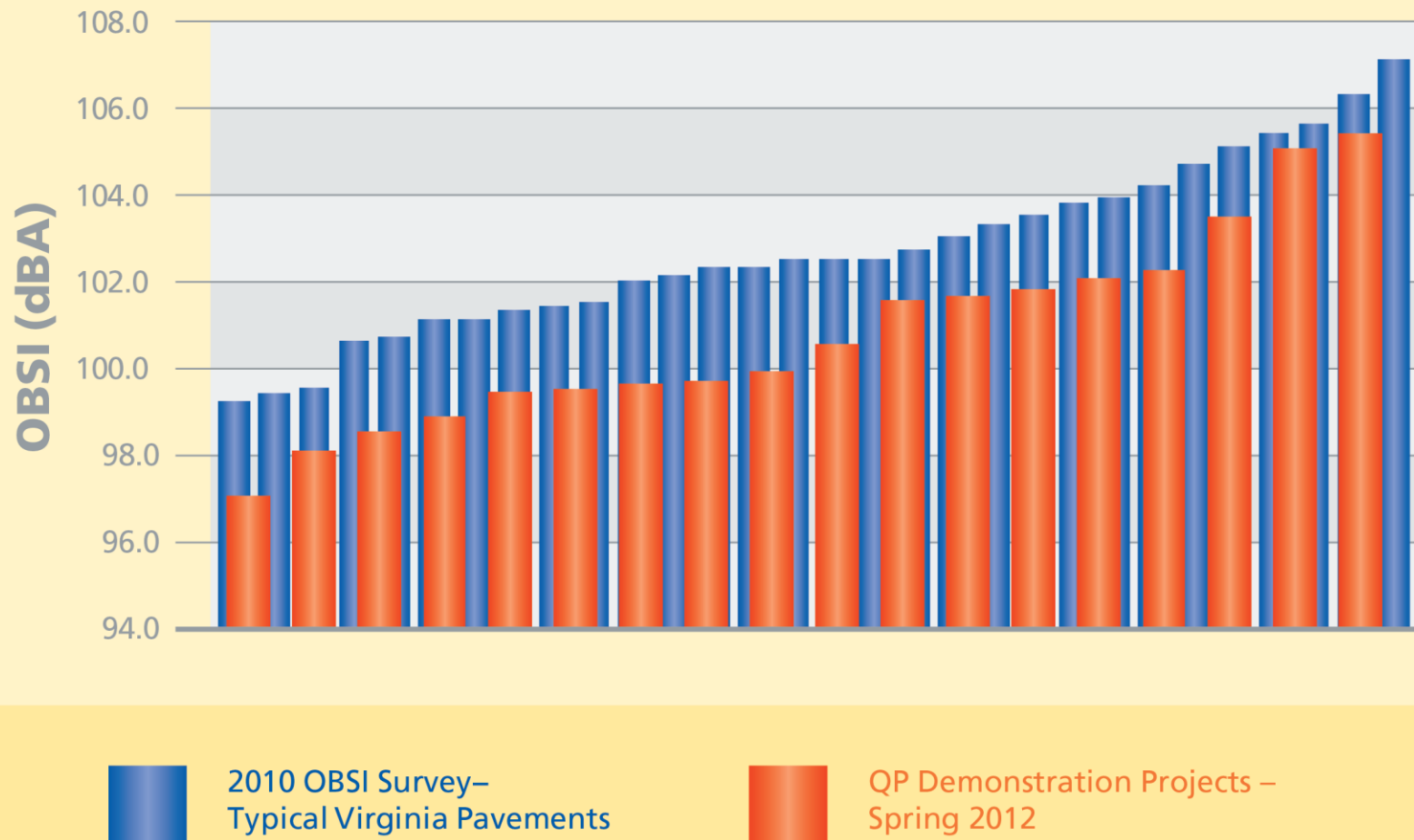
Wayside Noise ("Reduction")



QP Demonstration Projects – Spring 2012

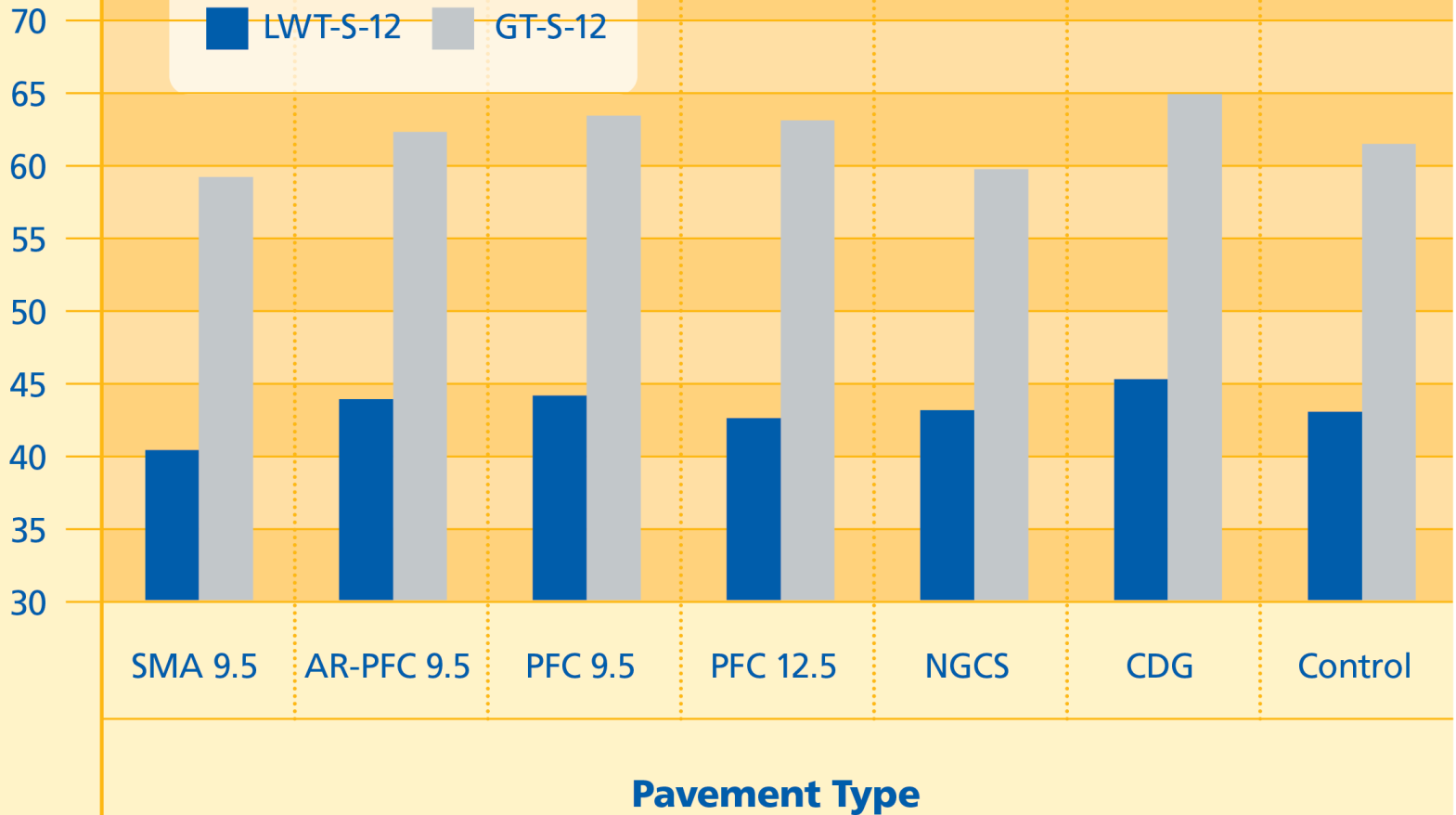


Typical Virginia Pavements vs. QP Demonstration Projects

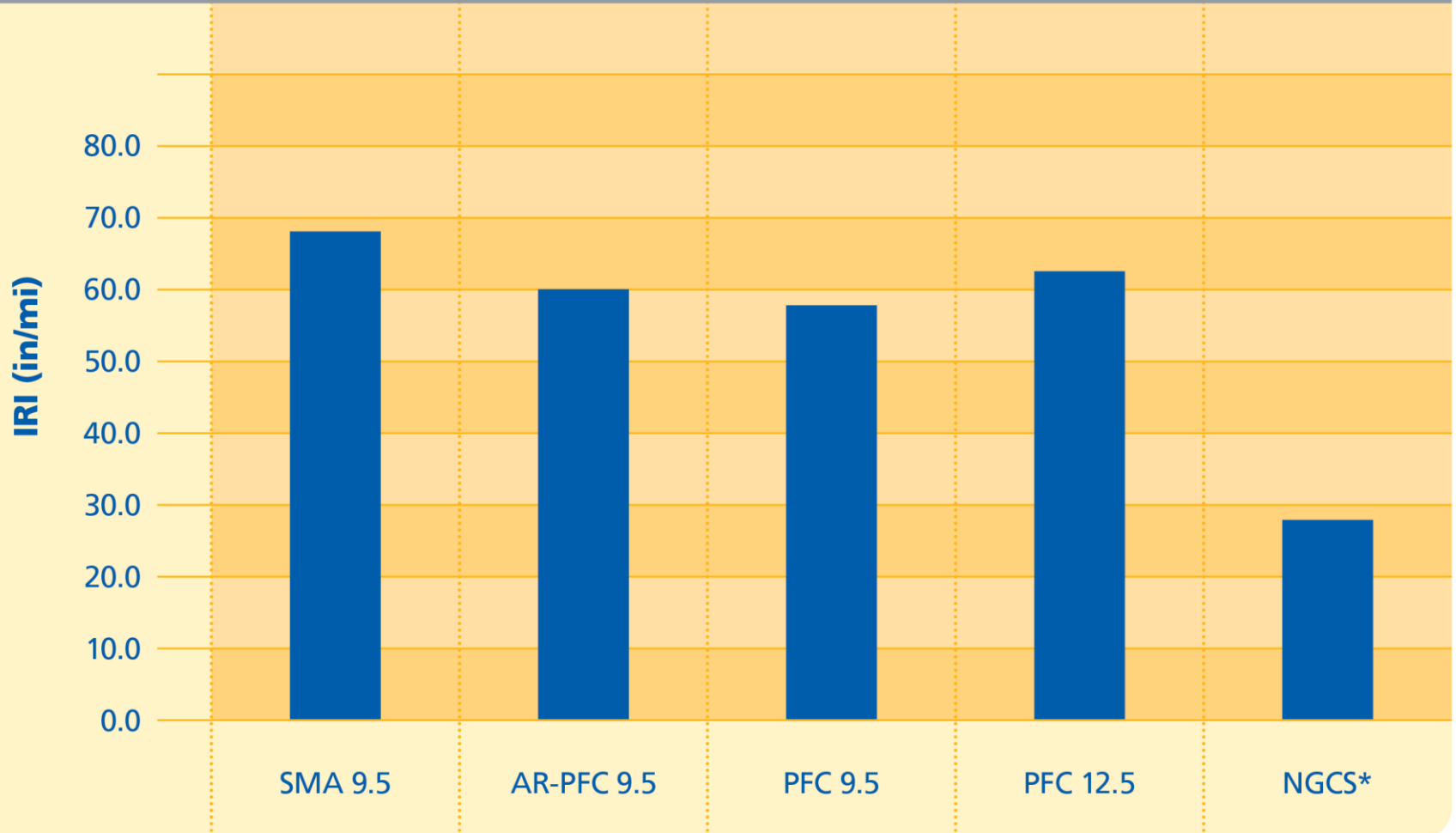


Friction – LWT & GT

Skid (SN) & GT*100 coefficients



Ride Quality (IRI)



Summary (Tire-Pavement Noise)

- Quiet asphalt technologies *measurably* less noisy on average than control (note: control technology NOT noisy)
- Next Generation Concrete Surface (NGCS) *noticeably* less noisy than control
- None of the surfaces became louder over the winter (note: milder than normal winter)



Summary (Other Properties)

- Ride quality is critical to quiet pavements and excellent ride quality was achieved in the projects.
- The QP technologies exhibit good resistance to skidding
- The QP technologies have reduced splash and spray with improved wet-weather visibility
- There were no reports of compromised safety during winter weather with QP



Next Steps

- Two most promising asphalt technologies to be tested at NCAT – starting fall 2012
- Two most promising technology components (rubber modified binder & PFC 12.5) to be installed summer 2012
- Noise (and other) testing continues
- Costs will continue to be evaluated
 - Life-cycle cost models to be developed



Life Cost Model Components

- Allowable substitution – will FHWA permit QP strategy in lieu of noise barriers?
- “Acoustic longevity” – QP replacement cycle?
- Additional maintenance costs – winter and periodic cleaning/vacuuming
- Value of other functional benefits – e.g., reduced rolling resistance, improved safety & comfort, etc.





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For more information:

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Links to Interim Report:

<http://leg2.state.va.us/dls/h&sdocs.nsf/0/e0a4b50ad340248c8525787e0057d09a?OpenDocument>

http://www.virginiadot.org/VDOT/Projects/asset_upload_file884_5721.pdf

